DESCRIPTION
The vaccine is composed of Hib Vaccine as a freeze dried powder which is reconstituted using liquid DTwP as a diluent:

a) DTwP vaccine (liquid).
The vaccine is a liquid containing purified diphtheria and tetanus toxoids, inactivated whooping cough (pertussis) organisms. The vaccine is adsorbed on to .......... (specify). ...... (specify) is used as a preservative (specify amount per dose). The potency of the vaccine per single human dose is at least 4 IU for pertussis, 30 IU for diphtheria, 60 IU for tetanus (determined in mice) or 40 IU (determined in guinea pig).

b) Hib vaccine.
The vaccine is a bacterial subunit vaccine containing highly purified, non-infectious *Haemophilus influenzae* type b (Hib) capsular polysaccharide chemically conjugated to a protein ...(specify. The polysaccharide is derived from Hib bacteria grown in chemically defined media, and subsequently purified through a series of ultrafiltration steps.

<table>
<thead>
<tr>
<th>COMPOSITION</th>
<th>Paediatric Dose</th>
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</thead>
<tbody>
<tr>
<td>Volume</td>
<td>0.5 ml</td>
</tr>
<tr>
<td>Diphtheria toxoid</td>
<td>xx Lf/ml ( ......IU/ml )</td>
</tr>
<tr>
<td>Tetanus toxoid</td>
<td>xx Lf/ml ( ......IU/ml )</td>
</tr>
<tr>
<td>Pertussis antigen</td>
<td>XX OU/ml</td>
</tr>
<tr>
<td>Nature of Aluminium salt and quantity as AL+++</td>
<td>XX mg/ml</td>
</tr>
<tr>
<td>Nature and amount of preservatives</td>
<td>XX mg/ml</td>
</tr>
<tr>
<td>Hib conjugate</td>
<td>XX µg/ml</td>
</tr>
<tr>
<td>Nature and quantity of stabiliser.</td>
<td>XX mg/ml</td>
</tr>
</tbody>
</table>

ADMINISTRATION
The lyophilizate must be reconstituted by adding the entire content of the supplied container of diluent to the vaccine vial. The vaccine pellet should be completely dissolved in the diluent. Following reconstitution, the vaccine should be inspected visually for any foreign particulate matter prior to administration. If observed, the vaccine must be discarded.

A sterile needle and sterile syringe must be used for the reconstitution of the vaccine and for each injection. The reconstituted vaccine should be used the same day (preferably immediately but by no means beyond six hours after reconstitution), and only then if the vial has been maintained between +2°C and +8°C and protected from sunlight. If not used immediately after reconstitution, the vaccine should be kept in vaccine carrier or refrigerator to maintain its temperature between +2°C and +8°C. Any opened container remaining at the end of a session (within six hours of reconstitution) should be discarded. The vaccine vial monitor for Hib component vaccine is attached to the vial cap and should be discarded when the vaccine is being reconstituted.
The vaccine should be shaken before use. The vaccine should be injected intramuscularly. The anterolateral aspect of the upper thigh is the preferred site of injection, or into the deltoid muscles of older children. An injection into a child’s buttocks may cause injury to the sciatic nerve and is not recommended. It must not be injected into the skin as this may give rise to local reaction. One dose is 0.5ml. A sterile syringe and sterile needle should be used for the reconstitution of the vaccine and for each injection.

**IMMUNIZATION SCHEDULE**

In countries where pertussis is of particular danger to young infants, the combination vaccine should be started as soon as possible with the first dose given as early as 6 weeks, and two subsequent doses given at 4-week intervals. The combined vaccine can be given safely and effectively at the same time as BCG, Measles and Polio vaccines (OPV and IPV), Hepatitis B, Yellow Fever vaccines and Vitamin A supplementation.

**SIDE EFFECTS**

The type and rate of severe adverse reactions do not differ significantly from the DTP and Hib vaccine reactions described separately. For DTP, mild local or systemic reactions are common. Some temporary swelling, tenderness and redness at the site of injection together with fever occur in a large proportion of cases. Occasionally severe reactions of high fever, irritability and screaming develop within 24 hours of administration. Hypotonic-hypoactive episodes have been reported. Febrile convulsions have been reported at a rate of one per 12500 doses administered. Administration of acetaminophen at the time and 4-8 hours after immunization decreases the subsequent incidence of febrile reactions. The national childhood encephalopathy study in the United Kingdom showed a small increased risk of acute encephalopathy (primarily seizures) following DTP immunization. However subsequent detailed reviews of all available studies by a number of groups, including the United States Institute of Medicine, the Advisory Committee on Immunization Practices, and the paediatric associations of Australia, Canada, the United Kingdom and the United States, concluded that the data did not demonstrate a causal relationship between DTwP and chronic nervous system dysfunction in children. Thus there is no scientific evidence that these reactions have any permanent consequences for the children.

Hib vaccine is very well tolerated. Localized reactions may occur within 24 hours of vaccination, when recipients may experience pain and tenderness at the injection site. These reactions are generally mild and transient. In most cases, they spontaneously resolve within two to three days and further medical attention is not required. Mild systemic reactions, including fever, rarely occur following administration of Hib vaccines. More serious reactions are very rare; a causal relationship between more serious reactions and the vaccine has not been established.

**CONTRAINDICATIONS**

Known hypersensitivity to any component of the vaccine, or a severe reaction to a previous dose of the combination vaccine or any of its constituents is an absolute contraindication to subsequent doses of the combination vaccine or the specific vaccine known to have provoked an adverse reaction. There are few contraindications to the first dose of DTP - fits or abnormal cerebral signs in the newborn period or other serious

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* In Weekly Epidemiological Record, No. 18, 7 May 1999. Page 139

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neurological abnormality are contraindications to the pertussis component. In this case, the vaccines should not be given as a combination vaccine but DT should be given instead of DTP and Hib given separately.

**Immune deficiency**
Individuals infected with human immuno-deficiency virus (HIV), both asymptomatic and symptomatic, should be immunized with combined vaccine according to standard schedules.

**STORAGE**
The combination vaccine should be stored and transported between +2°C and +8°C. IT MUST NOT BE FROZEN.

**PRESENTATION**
The vaccine comes in single dose vials or vials of .... (specify) doses.
Vaccine Val Monitors (VVMs) are part of the label on ……. (specify vaccine) supplied through ………. (specify supplier or manufacturer). The colour dot which appears on the label of the vial is a VVM. This is a time-temperature sensitive dot that provides an indication of the cumulative heat to which the vial has been exposed. It warns the end user when exposure to heat is likely to have degraded the vaccine beyond an acceptable level.

The interpretation of the VVM is simple. Focus on the central square. Its colour will change progressively. As long as the colour of this square is lighter than the colour of the ring, then the vaccine can be used. As soon as the colour of the central square is the same colour as the ring or of a darker colour than the ring, then the vial should be discarded.

**Fig. The Vaccine Vial Monitor**